

Determining the baseline clinical knee measurements in the multi-ethnic Malaysian children aged 1-3 years old- preliminary data

¹Hazwan Rusli; ¹Jamil K; ¹Abd Rashid, A.H; ¹Abd Rashid, A.F; Khairil Anuar Md Isa; Nazira A

¹Department of Orthopaedic & Traumatology, Faculty of Medicine, University Kebangsaan Malaysia (Kuala Lumpur), 560000, Cheras, Kuala Lumpur, Malaysia

INTRODUCTION:

Distinguishing physiologic and pathologic genu varus is challenging among children below age 3. Reference values for intercondylar distance (ICD) and tibiofemoral angle (TFA) in this age group differ across several studies. Local normative data on ICD and TFA across various ethnic groups (Malay, Chinese, and Indian) is needed.

METHODS:

A cross-sectional study was conducted from December 2023 until February 2024. The data was collected from children of multiple locations in Klang Valley which met our inclusion and exclusion criteria. The demographic and anthropometric data as well as the ICD and TFA measurement were taken.

RESULTS:

A preliminary sample size of 183 Malay children which divided into three groups of age were collated. We found that the mean of ICD (cm) for 3 groups of age in Malay children are 4.97 ± 1.62 , 1.43 ± 1.59 and 0.19 ± 0.5 respectively for 0-1, 1-2 and 2-3 years old. While the TFA (degrees) measurements are 9.62 ± 2.75 , -0.68 ± 5.0 and -5.55 ± 3.53 , respectively. One-way ANOVA test and post-hoc Tukey test shows significance difference ($p < 0.001$) in ICD and TFA for the 3 age groups.

Table 1: Mean \pm standard deviation of ICD and TFA in the Malay samples.

Age groups (months)	0-12 (N=86)	13-24 (N=53)	25-36 (N=44)
ICD (cm)	4.97 ± 1.62	1.43 ± 1.59	0.19 ± 0.5
P-Value	0.001*	0.001*	0.001*

TFA	9.62 ± 2.75	-0.68 ± 5.0	-5.55 ± 3.53
P-Value	0.001*	0.001*	0.001*

N=number of individuals, *significance difference from two age groups at $p < 0.001$ (one-way ANOVA, post hoc Tukey test).

DISCUSSIONS:

Understanding the normal physiological ranges of TFA and ICD equips clinicians with crucial information to formulate treatment plans and minimizing the need for unnecessary investigations of children. Alignment naturally improves over time without any need for intervention. However, in certain cases, this improvement may occur later than usual. The crux of the issue lies in determining the specific measurements and timeline that differentiate between physiological and pathological bowing. This is the pioneer study that was performed for children aged below 3 in Malaysia.

CONCLUSION:

Our preliminary data provides the normative values of knee measurement for the Malay children. Upon completion, we hope to assist doctors in determining the normative knee angle across different races and age groups (below 3) in Malaysia.

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